School Reform in the New Millennium:
Preparing All Children for 21st Century Success

Recommendations from the
Massachusetts Board of Elementary and Secondary
Education's Task Force on 21st Century Skills

November 2008

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November 18, 2008

Dear Board Members,

Eight months ago Education Secretary Paul Reville asked me to lead a group of business leaders, educators and lawmakers on a journey into the future of public education. Together we have explored ways to reform our methods of teaching and learning, and to transform the Commonwealth's public schools into 21st century centers of learning. This document offers recommendations for the Board and Department of Elementary and Secondary Education and Executive Office of Education to consider as we move to better prepare our students for academic and professional success in the new millennium.

The world is changing quickly around us, and there is growing concern among employers that our public schools are not keeping up. Today's new jobs require employees with more than a high school or college diploma; employers want future leaders who can think creatively, work collaboratively, take initiative and are globally aware. In short, they need candidates steeped in 21st century skills, and if they can't find them in Massachusetts they'll look in other states or overseas.

States like North Carolina, West Virginia and Wisconsin have made the integration of 21st century skills in their classrooms a top priority. Until now, Massachusetts has not specifically addressed incorporating these skills in a systemic way; our focus has remained on academic achievement. Without question that effort has paid off. Our curriculum and performance standards are widely hailed as among the strongest in the country, we score at or near the top on national assessments, and our students improve each year on our state exams.

Despite our record of success, our children need much more. While we must retain and build on our academic rigor, it is time for us to reinvent our schools from top to bottom to meet the economic and educational demands of the 21st century. Doing this will require a dramatic change in our thinking and expectations: From the way we teach to how our students learn, from the way we recruit, train and retain our educators to how we organize learning environments and structure each minute in every school day.

Change is never easy, and we recognize our recommendations will take time, funding and support to put in place. But as the world continues its rapid transition, we must keep pace.

Our children deserve nothing less.

Sincerely,

Gerald Chertavian
Chairman of the 21st Century Skills Task Force, member of the Massachusetts Board of Elementary and Secondary Education, founder and CEO of Year Up

Executive Summary of Recommendations

In 1993, a bipartisan effort launched by educators, business leaders and legislators resulted in the development and implementation of the Massachusetts Education Reform Act. Through this sweeping legislation a deal was struck: Districts would receive an unprecedented increase in funding in exchange for a marked annual improvement in academic achievement. The curriculum frameworks were developed to outline what students needed to know and be able to do in every subject, the Massachusetts Comprehensive Assessment System (MCAS) was developed to track achievement and identify gaps in performance. Everyone – from students to teachers to administrators - was held accountable for the results.

Fast forward 15 years to the present day. Student achievement in the Commonwealth has reached higher levels than ever before. In 2007, 87 percent of the class of 2009 passed the English Language Arts and math MCAS exams required to earn a high school diploma on their first try. In 2008, the first year the graduation requirement expanded to include the Science, Technology/Engineering (STE) exam, 80 percent of the class passed all three by the end of their sophomore year. In all, 60 percent passed STE and scored Proficient or above on the English and math exams.[1]

On national assessments Massachusetts outscores virtually every state. In 2005, Massachusetts became the first state to ever score first or tie for first on all four of the National Assessment of Educational Progress (NAEP exams). In 2007 we did it again[2]. On the SAT our results have risen each year for more than a decade, including 2008 when results in most other states remained flat or declined.

We are rightfully proud of our student's academic accomplishments, and must continue to build on our current level of academic rigor. But the changing economy and increasing expectations of employers make clear that a new phase of Education Reform must begin. Too many of our children are leaving high school unprepared for either college or a livable wage career. This reform must focus on ensuring that all of our children leave our schools college and career ready and prepared with the knowledge and skills required to compete successfully in the 21st century.

Where basic skills once sufficed for low-level jobs, those positions are scarce today. Employers now are seeking expertise in higher order skills such as complex communication, collaboration, problem-solving and information literacy.

In other words, today's employers want employees who can think on their feet, solve problems creatively, use technology to complete their work and work well in teams.

[1] Massachusetts Department of Elementary and Secondary Education, "Spring 2008 MCAS Tests: Summary of State Results," http://www.doe.mass.edu/news/news.asp?id=4287

[2] Massachusetts Department of Elementary and Secondary Education: http://www.doe.mass.edu/news/news.asp?id=2903 and http://www.doe.mass.edu/news/news.asp?id=3692

The problem is that those skills are not, and have never been, the focus in traditional public education. Shifting our focus to embed the delivery and acquisition of those skills into teaching and learning for students of all ages will require a shift in what we teach, how we teach it, the tools we use and how we train, recruit, nurture and retain our teachers and school leaders. According to Harvard Professor Richard Murnane, the overarching challenge for all educators today is to rethink not what they teach, but "how they empower students to use that information.[3]"

With Governor Patrick's support, Massachusetts was accepted as a leadership state in the national Partnership for 21st Century Skills in June 2007. In April 2008 Secretary Reville formed the Task Force on 21st Century Skills (See **Appendix B** for his statement), to be chaired by Board of Elementary and Secondary Education member Gerald Chertavian, who is the founder and CEO of Year Up.

Harvard Professor Richard Murnane writes that the overarching challenge for all educators today is to rethink not what they teach, but "how they empower students to use that information."

Members of the 20-member group included Board members Tom Fortmann, Harneen Chernow and Andrew Fajnzylber, as well as leaders and key stakeholders from the Legislature, education, business and technology (See **Appendix A** for full list of members).

The group was tasked with developing recommendations that build on our existing high standards by integrating 21st century skills and knowledge into our core educational program. Specifically, the Task Force was asked to identify appropriate standards, assessment tools, measures of accountability and professional development efforts that could lead to successful inclusion of 21st century skills.

To focus its work, Secretary Reville asked the Task Force to rely on the framework of broad categories and themes identified by the Partnership for 21st Century Skills:

- Information and communication
- Thinking and problem-solving
- Interpersonal and self-direction skills
- Global knowledge and understanding
- Financial, economic and business literacy, and developing entrepreneurial skills to enhance workplace productivity and career options
- Civic literacy

[3] *The New Division of Labor: How Computers Are Changing the Way We Work* (Princeton University Press and Russell Sage Foundation, 2004), by Richard Murnane and Frank Levy

Keeping those skills in mind, the Task Force worked in four subgroups to develop recommendations for changes in process and policy, as well as pilot programs that could be launched quickly to provide real-world examples of 21st century skills at work. The subgroups were established to divide the areas of focus into four segments: assessment and accountability; curriculum development, instruction and learning environments; standards and workforce development; and teacher preparation and professional development.

After eight meetings between May and October, the Task Force settled on the following five broad levers for change:

- **Educator Training and Development:** Overhaul the state's teacher training and professional development programs to recruit and retain high achieving educators who have a background in and up-to-date knowledge of 21st century skills.
- **Standards:** Raise the state's bar on rigor by embedding 21st century skills and content through the Commonwealth's curriculum frameworks in every subject.
- **Assessment:** Become a national leader in assessment by integrating the measurement of 21st century skills throughout the Massachusetts Comprehensive Assessment System (MCAS).
- **Accountability:** Hold teachers, administrators and the state accountable for incorporating 21st century skills into the curriculum in a complementary way and hold students accountable for learning them.
- **Demonstration Vehicles:**
    - Establish up to five 21st Century Districts and up to ten 21st Century Schools
    - Expand the number of Expanded Learning Time Schools to 100 or more
    - Establish the "Creative Teaching Partners Initiative," and strive to place up to 1,000 artists, scientists and/or engineers-in-residence in schools part-time over the next five years

This report will delve deeply into each lever, detail corresponding recommendations for changes in policy and practice and outline procedural steps that must be taken to ensure the capacity to support this work is firmly established across the Commonwealth.

We recognize that both the Commonwealth and the nation are currently grappling with the impact of a difficult fiscal climate. However, we urge state officials to accept that these recommendations represent opportunities to devote our resources to areas that will create the largest return. By replacing less effective practices with more efficient and productive ways of engaging our students, we will make a critical investment in the futures of our children, our workforce and our economy.

Background

In the 19th century, when Massachusetts became the first state in the nation to establish a single school system throughout the state, we were an agrarian society. Education was designed to provide every child, until the age of 16, with a working knowledge of Reading, Writing and Arithmetic – the "3Rs" – in no more than six hours a day and 180 days a year.

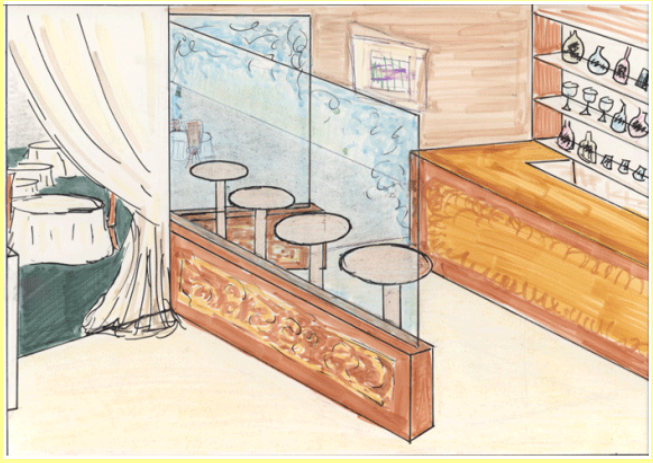
That vision of education met the state and national need at the time. Some went on to college, but most learned just enough to succeed after high school. Afternoons were kept open for chores and summers were left free to work the fields.

Nearly two centuries later, public education remains largely the same. Students still have summers off, schools still end the day mid-afternoon and our primary focus is still on the same three core academic subjects. Generally speaking, we have done little to universally challenge the assumptions about what students need to know and be able to do in an ever-evolving, technology-rich society.

Unfortunately, while public education has remained largely unchanged, nothing else has. The world has changed, as has society, the global economy and the demands of today's employers. To succeed in today's jobs, students need to master much more than the 3Rs; they need to be creative, collaborative, and be able to manage themselves, communicate well, use technology and solve complex problems in a global economy.

In short, they need to be 21st century learners, steeped in 21st century skills.

21st Century Skills in Action: Arlington High School, Gr. 11



Honors French students were divided into small groups and asked to **create a restaurant in France**. Students used the Internet to research real estate listings, learned about the Euro to consider price options, selected a financial planning method based on interest rates and incentive programs, and used professional software to create a business and marketing plan aimed at their target clientele. Once the plans were complete students developed and priced their menus, sketched out the interior design and used architectural software to lay out the furniture. The project ended with oral presentations done in both English and French. Local restaurant designers and architects were invited in to hear the English presentations. The project lasted the entire year, and was conducted entirely in French.
More on this project: http://www.doe.mass.edu/edtech/practices/arl/intro.htm.
21st century skills used in this project: technology; collaboration; global awareness; media literacy; creativity; financial, economic, business and entrepreneurial literacy.

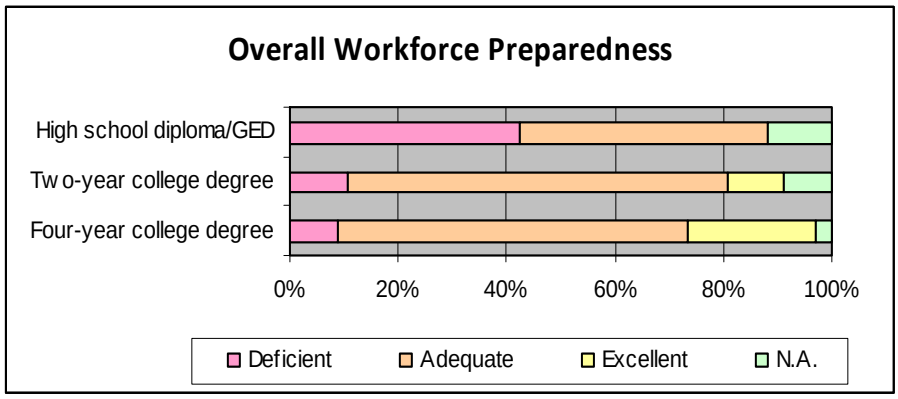
What are 21st century skills?

There are many variations on how to define 21st century skills. For our state, our understanding of them is informed by the work of the Partnership for 21st Century Skills, which developed a national K-12 educational framework through their extensive collaboration with leaders in business, government and education.

According to the Partnership's definition[4], 21st century learners must learn the following subjects and complementary skills:

- **Core Academic Subjects** include English, reading or language arts, world languages, arts, math, economics, science, geography, history, government and civics.
- **Interdisciplinary Themes** to be woven into each subject include global awareness, financial, economic, business and entrepreneurial literacy, civic literacy and health literacy
- **Learning and Innovation Skills** to be woven into each subject include creativity, innovation, critical thinking, problem solving, communication and collaboration
- **Information, Media and Technology Skills** required of today's students include information literacy, media literacy, communications and technology literacy.
- **Life and Career Skills** are the so-called "soft-skills" needed to navigate in today's fast-paced, high-technology world. They include flexibility, adaptability, initiative and self direction, social and cross-cultural skills, productivity, accountability, leadership and responsibility.

Of the skills identified by the Partnership, employers highlighted in a recent national study[5] of more than 400 employers across the United States cited the most important skills as professionalism, oral and written communications, teamwork, collaboration, critical thinking and problem solving.



Employers interviewed for "Are They Really Ready to Work?" reported that more than 40 percent of job candidates with just a high school diploma were unprepared, or "deficient" for the demands of the working world.

[4] Framework for 21st Century Learning, Partnership for 21st Century Skills, http://www.21stcenturyskills.org/index.php?option=com_content&task=view&id=254&Itemid=120

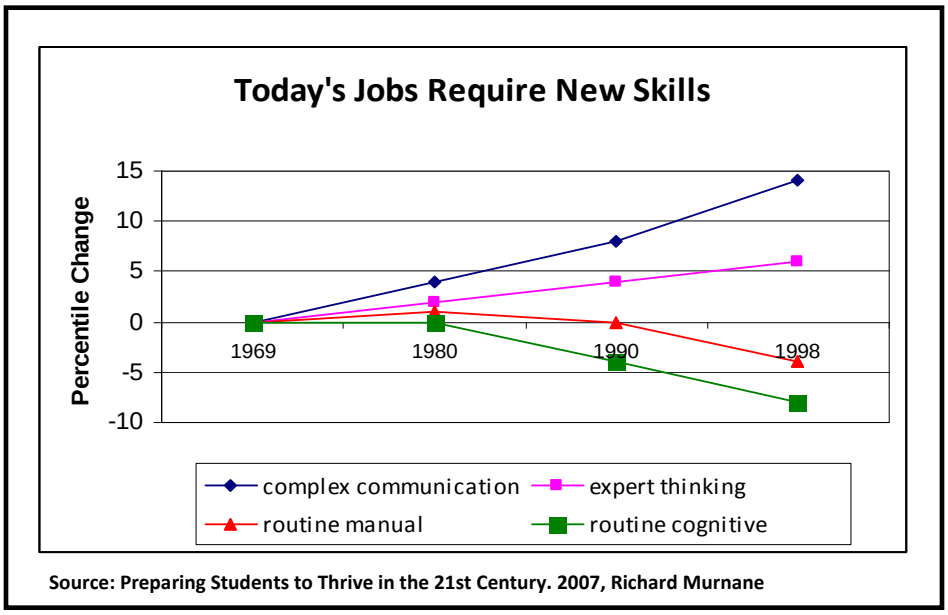
[5] Are They Really Ready to Work? Employers' Perspectives on the Basic Knowledge and Applied Skills of New Entrants to the 21st Century U.S. Workforce, conducted by the Conference Board, Partnership for 21st Century Skills, Corporate Voices for Working Families and the Society for Human Resource Management, 2008

Unfortunately, in the same study employers rated high school graduates as "deficient" in basic English, math and reading skills; written communications; critical thinking and problem solving; and professionalism.

Why now?

Over the past century our economy has evolved from agrarian to industrial to technological. As a result, jobs have gotten more complex, as have the needs of employers. Many of the basic skills positions that once sufficed for blue-collar workers can be done electronically or have been eliminated. Instead, today's economy supports more white collar positions that are complex, technologically advanced and require more advanced thinking skills than even a decade ago.

Between 2000 and 2015 about 85 percent of newly-created U.S. jobs are expected to require education beyond high school.[6] Employers surveyed for "Are They Really Ready to Work?" also predict that over the next five years the opportunities for four-year degree recipients will increase while the job opportunities for high school graduates will be drastically reduced.



Source: Preparing Students to Thrive in the 21st Century. 2007, Richard Murnane

That said, a four-year degree alone does not cut it anymore. A Massachusetts Business Alliance for Education study[7] found that state employers find local graduates lacking in the skills they seek: basic written and verbal communication, math and computer skills, problem-solving, overall demeanor, work ethic.

Put simply, today's jobs require not only rigorous preparation in the traditional core subjects, but higher order skills that enable each individual to become a valuable employee. It is the responsibility of our state to transition to a K-12 system that will provide all of our students with the skills they need to be prepared for post-secondary education and successful in the new millennium.

[6] "The Jobs Revolution: Changing How America Works," 2005, http://www.communitiesofthefuture.org/PDF/normaowen-article-aug14'08.pdf

[7] "Educating a 21st Century Workforce: A Call to Action for High School Reform," Massachusetts Business Alliance for Education, 2008, http://www.mbae.org/uploads/06102008230519EducatingA21stCenturyWorkforce.pdf

Vision for the Future

After five months of discovery, meetings and in-depth discussion, the Task Force has adopted a collective vision for the Commonwealth's 21st century students, teachers and schools.

The recommendations included in this report are spurred on by these basic facts:

- International assessments show that other countries have surpassed the United States in math and science education, despite steady growth in STEM-related fields
- Today's employers are seeking future workers and leaders who can think creatively, work collaboratively, take initiative and are globally aware
- Most new jobs require at least some post-secondary education
- We live in a data-driven, high-tech economy, but most students have more exposure to technology out of school than in school
- Employers are reluctant to hire high school graduates because they say they are unprepared for the realities and demands of today's working world
- Most people still do not know what 21st century skills are, let alone know how to teach or assess them.

As we move forward, the Task Force urges the Commonwealth to embrace this future vision for our students, educators and schools:

21st century students will learn to think both critically and creatively, be skilled at working collaboratively, and understand how to take risks constructively. They will learn and understand their connection to the world around them, use technology to do research and communicate with others, be comfortable working in teams and develop the strength and skill to assume leadership responsibilities. 21st century students will receive support and encouragement throughout their education to think about and plan for their futures.

21st century educators will be high achievers who will model the behavior they expect their students to learn. Through the use of team projects and the latest technology they will maintain a focus on core academic skills and use their classrooms as laboratories for students to explore, create and work together. They will participate in professional development opportunities – both online and in person – to keep their skills up-to-date, and collaborate with their colleagues around the state to share best practices.

21st century schools will be reconfigured as "learning environments" and built with the infrastructure to support the regular use of technology, with updated science laboratories and ample space for teachers to meet and collaborate. The school day will be extended to allow for more hands-on learning and classrooms will be designed to accommodate frequent group activities and presentations.

This vision for the future of public education in the Commonwealth is underscored by our commitment to maintaining strong, rigorous standards and ensuring that all students are taught the basic core academic content they will need to be successful in school, higher education, and in life.

Levers for Change

Lever I: Educator Quality and Support

Overhaul the state's teacher training and professional development programs to recruit and retain high achieving educators who have a background in and up-to-date knowledge of 21st century skills.

We cannot change how our students learn until our teachers are equipped to teach in new ways. It is unreasonable to expect that our students will ever gain the skills and knowledge to succeed in the 21st century if they are taught primarily by educators trained using a model developed in the 19th century.

To revamp how our students are taught the Commonwealth must improve the quality of our teaching force by heightening the rigor and expectations across the spectrum of services and requirements surrounding educator preparation, recruitment, licensure and re-licensure.

As a state we must seek to attract, nurture and retain the most capable, qualified and committed individuals into our educator workforce.

As a state we must seek to attract, nurture and retain the most capable, qualified and committed individuals into our educator workforce and create a working environment they will find fulfilling. This means providing our current cadre of educators with the professional development and training they need to update their techniques, and demanding that the next generation of educators be high achievers who come into our schools already 21st century-savvy and committed to continuing to grow and refine their skills.

The Task Force recommends that 21st century educators be equipped with these skills:

- A deep understanding and knowledge of the content in the subject(s) they teach
- Proficiency with reasoning, problem-solving, and critical thinking
- Technological competence and an ability to help students use technology effectively
- The ability to collaborate effectively with other teachers and with experts from other fields
- A working knowledge of STEM-related subjects and an understanding of their relevance in today's global economy
- Global and cultural knowledge and understanding
- An ongoing and measurable commitment to improving instructional practice

Transforming the teaching profession to achieve these goals will not be easy, but it is possible. Programs like Teach for America, UTeach, Math for America and the New Teacher Project have demonstrated that hundreds of thousands of top-notch people are eager to enter the profession, given the right system of incentives and supports.

Specific recommendations for this lever are:

- Redesign the teacher preparation, licensure and professional development systems to attract, retain and nurture high-achieving candidates. Enable them to obtain a rigorous, content-rich education, supplemented by high-quality pedagogical experience and training from instructors with broad, recent experience in K-12 classrooms. Create a system of oversight to ensure that all preparation and professional development programs include 21st century skills when appropriate.

- Build public/private partnerships to create summer internships and other opportunities to enhance teacher growth and learning.

- Offer unique professional development opportunities for educators, administrators, and the entire staff of the Department of Elementary and Secondary Education to reinforce the importance of embedding 21st century skills in public education, administration and state leadership.

- During the licensure process and through on-going professional development, require all educators to demonstrate mastery in the use of technology to teach, assess and manage student learning. Rewrite licensure regulations to build this requirement in to certification and re-licensure standards.

- Develop a series of online "Hubs" for information, best practices, and success stories, to be managed and monitored by the Department of Elementary and Secondary Education. These should include a "Curriculum Hub" for exemplary 21st century skills curriculum, a "Professional Development Hub" for exemplary PD curriculum to improve instructional practice and an "Assessment Hub."

21st Century Skills in Action: Teaching for Global Understanding

Primary Source, a professional development organization focused on history and the humanities, recently offered educators a course to link them with their international peers. *Teaching for Global Understanding in the 21st Century* readied educators to provide their students with the content knowledge of other cultures, peoples, and histories. The intensive one-week summer program provided 57 educators with a strong background in a range of contemporary global issues, an introduction on how to address these challenges, and a model for using new technologies to develop students' 21st century skills, such as cross- cultural communication and critical thinking. Educators of all grade levels and subjects explored themes that cross national boundaries including the global economy, social justice and human rights, the globalization of culture, the environment, and health and education."
More on this project: http://www.primarysource.org.
21st century skills used: collaboration, leadership, global awareness, media literacy, technology, communication.

Lever II: Standards

Raise the state's bar on rigor by embedding complementary 21st century skills and content throughout the Commonwealth's curriculum frameworks in every subject.

In Massachusetts, the cornerstone of the curriculum in every major subject is culled from the state's Curriculum Frameworks. These frameworks detail what every student should know and be able to do in the Arts, English Language Arts, Foreign Languages, Health, Math, History and Social Science, and Science and Technology/Engineering. Each was developed with considerable feedback and input from educators across the state, and is updated and reviewed on a regular basis.

The frameworks are one of the most successful products of Education Reform, and have led to a significant upgrade in the quality and consistency of curricula statewide. But the needs and demands of the 21st century make clear that straight academic content is no longer enough.

The Task Force recommends raising the bar on rigor by weaving 21st century knowledge and skills throughout each subject in a complementary way to encourage students to learn critical skills as they learn academic content.

Many of the state's vocational-technical education schools have already demonstrated how this can be done well. Just a few decades ago vocational schools were seen as the place to send low-performing students, but today they are hailed for offering the right mixture of high expectations, challenging coursework and hands-on learning.

The results are in the numbers: More than 27,000 Massachusetts students attend the state's 26 voch-techs, more than 2,800 are on waiting lists, and enrollment is up 15 percent over the last decade. MCAS results among vocational school students have risen 40 percent since 2001, and the graduation and MCAS passing rates at vocational schools surpass the state average.[8]

Doing this right will require a shift in our curricular priorities.

Replicating this success statewide will require a shift in our curricular priorities. It is unreasonable to expect educators to rewrite their curriculum to incorporate this new material – e.g., global awareness, technology, media literacy – without removing or at least reducing the focus on other, less relevant material. These decisions will be difficult to make, but will be critical to the Commonwealth's overall effort to prioritize 21st century skills and knowledge in our public schools.

In addition, the Task Force urges the state to recommit to participating in Achieve Inc.'s American Diploma Project (ADP) to ensure that our standards are equal to, if not stronger

[8] Vocational-Technical Education in Massachusetts, published by the Pioneer Institute, October 2008 http://www.pioneerinstitute.org/pdf/wp42.pdf.

than, national benchmarks. The ADP was formed to ease the frustration of employers and higher education leaders who saw too many high school graduates were unprepared for the demands of college or career. In working directly with more than 30 states – including Massachusetts – ADP aims to ensure that state standards are aligned with the expectations of colleges and employers, and meet or exceed international standards.[9]
Specific recommendations include:

- Review and update all of the state's curriculum frameworks to ensure 21st century skills and content are appropriately developed and taught in all subjects. In doing so, review the content of each framework to place focus on subject matter most relevant to today's world.

- Prior to bringing revised frameworks to the Board of Elementary and Secondary Education for approval, review each with the Partnership for 21st Century Skills for alignment with 21st century skills; and with Achieve Inc.'s American Diploma Project for alignment with international benchmarks and the expectations of higher education and employers.

- Create and promote new and existing scholarships and certificates that offer incentives for proficiency in 21st century skills. Existing programs and certificates that could be recast to meet this recommendation include MassCore, the Certificate of Mastery and the Certificate of Occupational Proficiency.

- Encourage schools to offer online learning options to students and establish strict guidelines for oversight by the Department of Elementary and Secondary Education to regulate content and quality of the online courses offered.

- Commit Readiness Centers across the Commonwealth to serve in part as 21st century skills capacity-building centers to assist schools and districts in curriculum and instruction. These Centers were recommended by Governor Patrick in June 2008 as part of his complete education agenda, developed through the Commonwealth's Readiness Project[10]. They are described as being dedicated to the "continuous improvement of education at all levels of our public education system."

[9] Achieve, Inc.'s American Diploma Project Action Agenda: http://www.achieve.org/node/319

[10] "Ready for 21st Century Success: The New Promise of Public Education," http://www.mass.gov/?pageID=eoetopic&L=2&L0=Home&L1=Commonwealth+Readiness+Project&sid=Eeoe

21st Century Case Study: Mathematics

The intersection of mathematics and 21st century skills is remarkably broad. Critical thinking, logical reasoning, and problem solving—high on any list of 21st century skills—are central to mathematics as it should be learned and taught. All students need to acquire 21st century habits of mind, such as conjecturing, visualizing, analyzing complex choices, estimating, exploring, justifying, finding connections, and constantly asking "Why?" There is no better place to do that than a well-taught mathematics classroom.

Contemporary mathematics instruction has been criticized for focusing on memorization of terms and procedures while neglecting 21st century skills. Now is the time to rejuvenate 21st century skills that are dormant in the K-12 curriculum by symbiotically improving mathematics instruction.

Twenty-first century skills permeate the Commissioner's *Guidelines for the Mathematical Preparation of Elementary Teachers*. The *Mathematics Curriculum Framework*—currently under review—discusses problem solving, communicating, reasoning, connecting, conjecturing, and justifying in the Guiding Philosophy section that precedes detailed Learning Standards.

This Task Force hopes that the Framework Review Panel will elaborate and emphasize those words with a 21st century endorsement, and that educators will look to mathematics classrooms as an important and cost-effective venue for developing 21st century skills.

21st Century Skills in Action: Whitman-Hanson Regional

Students and teachers in the district's 7 schools participated in learning about the Chinese Spring Festival, the Year of the Rat. In the fall, a Chinese New Year Task Force was organized, including administrators, teachers, and the Chinese Guest Teacher, Liu Hongwei. Each principal selected two teachers who led staff in developing projects for two months prior to the Spring Festival. Projects varied from school to school, involving students and staff from kindergarten to twelfth grade. High school art students used the Internet to research the Chinese New Year for the construction of a Chinese dragon which was displayed at a district-wide celebration. ***21st century skills used: collaboration, technology, global awareness, creativity.***

Lever III: Assessment

Become a national leader in assessment by integrating the measurement of 21st century skills throughout the Massachusetts Comprehensive Assessment System (MCAS).

Massachusetts is recognized nationally for holding all students to high standards, and for developing an assessment system that provides annual measurements of student achievement in English language arts, math, Science and History. A decade after the first administration of the Massachusetts Comprehensive Assessment System (MCAS), marked improvement is evident in the performance of students in all subgroups at all grades.

Even so, achievement gaps still linger and new data have proven that simply passing the MCAS does not translate into higher education success. The 2007 Massachusetts School to College Report[11] illustrated that of the more than 19,000 students in the class of 2005 who chose to enroll in one of the Commonwealth's state colleges or university campuses, 37 percent required at least one remedial course during their first semester in college.

We must build on the existing MCAS to ensure that it holds students to a high standard while also assessing their attainment of higher order skills they need to be successful in the 21st century. This is also a priority nationwide: A recent survey by attendees at the National School Boards Association conference found that nationwide, more than 50 percent of district leaders agree that multiple measures should be used by schools and districts to assess students on what they know and are able to do in essential skill areas. Attendees listed developing this type of assessment as the top education technology priority for the new Administration and Congress.[12]

> Our understanding of what "rigor" means must extend beyond the mastery of academic content.

To that end, the Task Force recommends the state maintain the existing rigor of the MCAS exams and strengthen them by adding complementary measures, including some that are locally administered, to assess student achievement in 21st century skills. This could be done in a number of ways, including open-ended questions that require on-line research, scientific experiments that must be done in a lab, oral presentations and projects that require teamwork and collaboration to complete.

Specifically, the Task Force recommends:

- The Task Force urges the Board of Elementary and Secondary Education to call for the U.S. History exam to be revamped to become the state's first MCAS exam to test proficiency in both content and 21st century skills. The Task Force suggests the existing exam be reconfigured to test students on their content knowledge and

[11] "Massachusetts School to College Report, High School Class of 2005," February, 2008, http://www.doe.mass.edu/research/reports/0208bhe.doc

[12] "School Districts Call for New Administration to Address 21st Century Skills," October 29, 2008, www.nsba.org

global awareness in a traditional way and to require a demonstration of 21st century skills through research, collaboration and oral presentations.

- Develop and formalize partnerships with higher education and private sector institutions to explore innovative ways to improve the Commonwealth's assessment system.

- Work with the MCAS contractor to revamp the state's assessment system to rely on both statewide and locally embedded performance-based assessments. The new design should include both summative and formative assessments that involve performance- and project-based tasks.

- Continue to administer the existing Science, Technology/Engineering (STE) MCAS exam, but begin development of an updated version that will require students to not only pass the MCAS to earn their competency determination, but also demonstrate their STE knowledge through locally administered and assessed projects and lab experiments.

- Participate in multiple global benchmarking opportunities (e.g., TIMSS) to analyze how the performance of Massachusetts students compares to their international peers.
    - Massachusetts opted to participate in the 2007 Trends in International Math and Science Study (TIMSS) administration as a "nation.[13]" Results will be available in early December 2008.

21st Century Skills in Action: LIFT² Program

Science teachers in the Needham Public Schools are bringing 21st Century Skills to students in their classrooms through the LIFT² Program, sponsored by the Metro West STEM Education Network. Seven Needham educators participated in an eight week summer externship and a year of innovative graduate course work to gain first hand experiences with 21st century workforce skills in STEM companies. Participating teachers developed a strong background in real world contemporary skills, how to integrate them into their curriculum, and insight into the skills that today's students will need in the workplace. As a result, students are being exposed to more engineering, hands-on, real world inquiry-based projects; they are interacting with STEM professionals, using technology tools for inquiry, analysis and communication, and developing the collaborative and critical thinking skills that they will need to adapt and succeed in a rapidly changing economic and social environment. More on this program: http://www.lift2.org/.

21st century skills used: leadership, collaboration, creativity, communication, problem solving, technology.

[13] Massachusetts to Participate in 2007 TIMSS as a Nation, http://www.doe.mass.edu/news/news.asp?id=3019

Lever IV: Accountability

Hold teachers, administrators and the state accountable for incorporating 21st century skills into the curricula in a complementary way and hold students accountable for learning them.

To successfully implement the full-scale change in thinking, teaching and learning detailed in this report, clear measures of accountability must be established to ensure that everyone – from administrators to teachers to students – holds up their end of the bargain.

Massachusetts can learn from the experience of West Virginia, which has overhauled the focus of its public school system to fully integrate 21st century skills. Education officials from that state today largely credit their success to an early effort to educate everyone – from teachers to administrators to Department of Education staff – about the importance of 21st century skills. Early in the process West Virginia officials also detailed areas of responsibility for implementation and detailed measures of accountability for everyone involved.

We must find a new way to measure the degree to which students are learning the skills they will need to be successful in the 21st century workplace.

In addition to meeting our state and federal accountability mandates, we must find a new way to measure the degree to which students are learning the skills they will need to be successful in the 21st century workplace. Nowhere in our current accountability system is a measure to gauge the quality of teaching or the degree to which students are being taught to perform, think and/or learn.

An opportunity exists now that the Office of Educational Quality Assurance has been moved into the Department of Elementary and Secondary Education. Our approach to accountability will shift to support and build the capacity of districts to improve themselves. This shift creates the possibility to establish new accountability measures and to redefine the roles stakeholders in our educational system play in building, supporting and maintaining our public schools.

To that end, the Task Force recommends:

- Develop a growth model component of the state's assessment system.
    - This will allow educators to track the progress of individual students over time to individualize instruction, and allow the state to develop more accurate and reliable measurements of school and district performance.

- Develop Teaching Quality Audits (TQAs) to examine curricula and teaching to be conducted as part of regular district reviews by the Department.

- Require all students to use technology to research, develop, complete and present a locally-evaluated Senior Project prior to graduation to demonstrate their mastery of 21st century skills.

- Examine ways to incorporate performance assessment of 21st century skills and knowledge into the state's accountability system and provisions.

- Pursue the development of a Creative Challenge Index to measure the number and quality of opportunities schools provide for students to engage in creative work.

21st Century Skills in Action: Manchester Memorial School, Gr. 6

A social studies unit on Africa was used to teach global awareness, technology skills, music and art at this Manchester-Essex school. Each student chose an African country to study in depth, did their research online, created their final projects using Powerpoint and presented them using SMART Boards. While this project was ongoing, students discussed and constructed African masks in art class, and learned about and practiced African drumming in Music class. More on this program: http://www.doe.mass.edu/edtech/practices/manchester/intro.htm.

21st century skills used in this project: global awareness, creativity, technology, collaboration, communication, problem solving

Lever V: Demonstration Vehicles

To many, "21st century skills" is a vague, hard-to-define phrase. It sounds interesting, but few understand how it would look in practice. To clarify its intent and demonstrate its possibilities, the Task Force recommends a combination of state and private funding be used to finance several pilot initiatives to demonstrate real world use of 21st century skills.

Given the Commonwealth's current fiscal climate, this is the right moment to reach out to private businesses and philanthropic agencies across the state and urge their support in the development of a **21st Century Innovation Fund**. This fund could be run and maintained privately, similar to the Afterschool for All Partnership, and could be used to supplement any available state support toward the development of some or all of the programs listed below.

Each successful program could be held up as an exemplar to build understanding, support and a common will for further investment and statewide change.

#1: Establish up to five 21st Century Districts and up to ten 21st Century Schools in other communities.

The Task Force recommends that up to five districts be selected to fully transform themselves into the Commonwealth's first 21st Century Districts, and that up to ten schools in other communities be selected to reinvent themselves as stand-alone 21st Century Schools. Preference will be given to schools and districts in any of the state's Commissioner's Districts[14].

Those selected through a competitive grant process would be eligible for private support through the Innovation Fund, and if funding is available, could also receive additional state assistance. The funding will be used to cover all costs related to completing the transformation to a 21st century district or school, including salary adjustments, improvements in technology infrastructure, professional development opportunities, etc.

The districts and schools will receive support, oversight and guidance from the Department's new office of Leadership and School Redesign. Each will be required to commit to following a set of exemplary performance standards established by the Department, and to partner with existing programs aimed at improving teacher quality and placing only the "best and the brightest" in classrooms.

Districts would negotiate waivers from district and union policies and from work rules from the state, local school committee and union leadership to make necessary changes to each school's schedule, calendar, curriculum, staffing or leadership.

[14] There are 10 Commissioner Districts, which have been grouped together by the Department of Elementary and Secondary Education to organize support and assistance. All are urban and are similar in size, demographics, level of infrastructure and serve some of the highest percentages of students living in poverty in the state. The districts are Boston, Brockton, Fall River, Holyoke, Lawrence, Lowell, Lynn, New Bedford, Springfield and Worcester.

Individual schools selected would remain under the leadership of the district superintendent and School Committee. To participate, school leaders would negotiate waivers as needed with the district administration and union to make necessary schedule, calendar, curriculum, staffing or leadership changes.

Each selected district or school would be expected to, at minimum:

- Articulate plans to significantly redesign ways to engage students
- Increase their technology infrastructure and use of computers in the classroom
- Commit to and provide professional development opportunities for all school and district staff on the integration of 21st century skills
- Enhance their teaching force by recruiting educators who have completed programs including Teach for America, UTeach, Math for America and the New Teacher Project
- Develop a strong induction and mentoring system to ensure new teachers have a support system in their first few years

To receive the grant award, leadership from the districts and schools must:

- Show community, educator, union and leadership support for the change
- Document what steps they have already taken to integrate 21st century skills and present plans for how they will use the funds to build on their existing infrastructure over a 3-5 year turnaround period.
- Commit to participating in either Expanded Learning Time, the Creative Teaching Partners Initiative or both (see below for details).
- Commit to spending a portion of the funding to document and share best practices and to support teacher planning, development and collaboration.

#2: Expand the number of Expanded Learning Time schools to 100 or more.

In 2005, the Massachusetts state legislature authorized funding for the Expanded Learning Time (ELT) Planning and Early Implementation Grant program to further its longstanding commitment to improving student outcomes and reducing the achievement gap. Recipient schools were provided with $1,300 per enrolled student in exchange for a commitment to increase their school day and/or year by a minimum of 25 percent per year.

The impact already shown great promise. There are currently 26 schools implementing the ELT program, and dozens more competing for planning grants each year. According to a recent evaluation by the Department of Elementary and Secondary Education,[15] schools that use the time differently and found ways to better engage their students in projects and other real-world activities reported an overall increase in achievement.

The Task Force recommends the number of ELT schools be quadrupled over the next five years, and that all schools commit the additional time to building 21st century skills.

[15] "Evaluation of the Expanded Learning Time Initiative: Year One Report," http://www.doe.mass.edu/research/reports/0208elt.html

#3: Expand the "Creative Teaching Partners Initiative," and strive to place up to 1,000 artists, scientists and/or engineers-in-residence in schools part-time over the next five years.

There is no question that students learn best when they are able to connect what they are learning to the real world. With that in mind, the Task Force recommends bringing a cadre of practicing professionals into the classroom in a statewide program modeled after the Massachusetts Cultural Council's Creative Teaching Partners Program (see box below).

Participants would be required to complete a training program and then to commit to either an intensive two-week residency or to an ongoing part-time position for up to 100 hours over the course of the school year. Visiting teachers would be encouraged to collaborate with the classroom teachers on curricula and to develop alternative, pull-out seminars for students to complete hands-on science or art projects.

21st Century Skills in Action: Creative Teaching Partners Initiative

The Massachusetts Cultural Council's **Creative Teaching Partners Initiative** connects schools, cultural groups, social service organizations, and others with outstanding artists, science educators, cultural organizations, and folklorists qualified to conduct in-depth residencies, professional development workshops for educators, school and district planning projects, and youth development programs. The Partners are individual artists, artist groups, and science educators who have track records working in school and/or after-school settings and maintain active professional involvement in arts, humanities, or science disciplines and in their education work. These artists and educators have a commitment to ongoing professional development that enhances their artistic, scientific, and pedagogical skills.

More on this program:
http://www.masculturalcouncil.org/services/partners.html

21st century skill used: creativity, collaboration, global awareness

Process

Change takes time, support and effort. Change of this magnitude will also require the right mixture of buy-in, visibility and planning for oversight and accountability.

Done right, the changes recommended will propel the Commonwealth's public schools into the nation's next phase of Education Reform. Done wrong, the state will be forced to inch along as other states move quickly, leaving our schools – and our students – behind.

The Task Force recommends the following steps be taken:

- Encourage the Executive Office of Education to draft a set of principles and a vision for the Commonwealth's 21st century students, educators, schools and districts, to be adopted by the Boards of Early Education and Care, Elementary and Secondary Education and Higher Education.

- Build support among the universe of education stakeholders, which includes legislators, educators, business leaders, parents and the general public. This can be done through a combination of face-to-face meetings, regional forums aimed at sharing best practices, and a statewide marketing campaign designed to build overall support for the need to teach, learn and live 21st century skills each day.

- Clearly define the role of the Department of Elementary and Secondary Education in this effort and establish accountability measures in the implementation and create a structure within the Department to build the capacity needed to build, support and maintain the recommended changes.

- Create an advisory council charged with building public support, making policy recommendations to the Board and/or Department of Elementary and Secondary Education and provide support to schools and districts committed to adopting 21st century skills. The council members will represent a mix of high-profile business leaders, educators, union leaders, parents, students, professional development providers and others with a proven commitment to supporting and improving 21st century skills.

- Encourage the Massachusetts Association of School Superintendents, Massachusetts Association of School Committees, the Massachusetts Teachers Association and the state's members of the American Federation of Teachers to hold a joint conference to discuss ways to work together to integrate 21st century skills in our schools.

- Collaborate with other New England states to adopt a common set of 21st century skills standards and policies.

Appendix

A. Members of the Board of Elementary and Secondary Education's Task Force on 21st Century Skills

- James Canavan, Director of Human Resource Operations for Boston Medical Center
- Harneen Chernow, Vice Chair of the Board of Elementary and Secondary Education
- Gerald Chertavian, Founder of Year Up, Member of the Board of Elementary and Secondary Education, Chairman, Task Force on 21st Century Skills
- Chris Dede, Harvard Graduate School of Education Professor of Technology, Innovation, and Education
- Nick Donahue, President and CEO of the Nellie Mae Education Foundation
- Paul Dulac, Superintendent of the Marblehead Public Schools
- Kathy Ennis, Executive Director of Primary Source
- Charles Fadel, Global Lead, Education for Cisco Systems, Inc.
- Andrew "AJ" Fajnzylber, Chairman of State Student Advisory Council, Member of the Board of Elementary and Secondary Education
- Tom Fortmann, Member of the Board of Elementary and Secondary Education
- Chris Gabrieli, Chairman of Massachusetts 2020
- Paul Grogan, President of the Boston Foundation
- Rep. Patricia Haddad, Co-Chair of the Joint Committee on Education
- Robert Richardson, Education Program Manager at Intel
- George Russell, Executive Vice President of the State Street Corporation
- Eric Schwarz, President and CEO of Citizen Schools
- Gail Snowden, CEO of Gail Snowden Consulting Services
- Adria Steinberg, Vice President of Jobs for the Future
- Paul Toner, Vice President of the Massachusetts Teachers Association
- Anita Walker, Executive Director of MA Cultural Council
- Andrew Zimmer, Broad Institute
- Isa Zimmerman, University of Massachusetts

The Task Force held a public forum on August 20, and seven public meetings: June 6, June 27, July 16, August 20, September 9, September 29 and October 15.

B. Statement from Education Secretary Paul Reville calling for the creation of the 21st Century Skills Task Force, April 29, 2008

"Americans increasingly recognize that the U.S. education system can and should do more to prepare our young people to succeed in the rapidly evolving 21st century. Skills such as global literacy, problem solving, innovation and creativity have become critical in today's increasingly interconnected workforce and society." -- The Partnership for 21st Century Skills

Massachusetts' leaders in business, government education believe that if the Commonwealth is to be competitive in the future, our education system must do a better job of education our young people in the core disciplines and in those subjects and skills necessary for success in the 21st century. The Board of Elementary and Secondary Education presides over the state's education system and has taken leadership in setting ambitious standards for students' learning in the core academic subjects. Those standards must be complemented, not replaced or diluted, by additional standards of knowledge and skill which will ensure that all of our students are prepared for success in post secondary education and in the jobs of the 21st century. A recent report (jointly released by the departments of Higher Education and Elementary and Secondary Education) about the high level of first year college student's remediation needs underscores this point.

We are not currently providing students with the skills they need to be successful in a technologically complex, globally competitive world. In many of our schools, there is insufficient time and attention given to broader skills' development and learning in areas such as oral communication, information processing, the application of technology to complex problems, critical thinking, media literacy, creativity/innovation, global awareness, cultural competency, problem-solving, teamwork/collaboration, self-directed learning and leadership. In many cases, these skills can be, and sometimes are, included in the strategies teachers use to address core subjects, however too often, these skills are neglected. Recognizing time limits and the pressures of current accountability incentives, the Board, nonetheless, is considering how to encourage a balanced education.

The Board of Elementary and Secondary Education is convening a Task Force on 21st Century Skills to assist the Board in considering how to infuse 21st century learning into the work of the state's public schools. Specifically, the Task Force is being asked to recommend how the Board might supplement its work on standards, assessments, accountability, curriculum, professional and teacher development to signal educators across the Commonwealth that 21st century skills should be infused into the curriculum.

The Task Force on 21st Century Skills will be charged with reviewing the literature on 21st century skills; making recommendations on how 21st century skills can be integrated into or used as a supplement to the state's existing educational program; identifying appropriate standards, assessment and accountability components as well as curriculum, professional and teacher development that will lead to successful inclusion of 21st century skills; and preparing a white paper to assist the Board in giving further consideration to these issues.

C. Opinion/Editorial by Gerald Chertavian, Worcester Business Journal:

The Time Has Come For Our Schools to Enter the 21st Century

At a charter school in California, fourth and fifth graders study rare insects using an electron microscope via a fiber-optic link to a nearby University. At an elementary school in Washington, fourth graders learn reading, writing, math, science and technology while learning about lizards. And at a Seattle high school, 10th graders work on deadline with local architects to design "schools of the future."

Welcome to public education in the new millennium, where the classrooms have no walls, pencils and paper have been traded in for computers, and the traditional "3 Rs" have been merged with a new set of skills now deemed equally as important: 21st century skills.

This catch-all phrase covers a spectrum of skills that today's employers say will be required to be successful at tomorrow's jobs: critical thinking, creativity, innovation, leadership, cultural competency, global awareness, and media literacy.

Experts agree that even in states like Massachusetts, where we lead the nation on standardized assessments, today's global economy demands more than high test scores to succeed after high school. To graduate ready to compete with their peers from around the world, our students need to be both booksmart and steeped in these skills.

This means that things have to change. To integrate the right blend of 21st century skills in the classroom effectively, we need to rethink the whole system, beginning with how we train our teachers, how we educate our students and what we teach.

Skills like creativity and leadership cannot be simply "taught" like English and mathematics. Instead educators need to learn to reshape their curricula to include opportunities to introduce these skills, such as projects that encourage innovative thinking, group assignments that encourage leadership, and computer-based assignments that make better use of technology.

The time is right for Massachusetts to set its old ways aside and rethink how our public schools should look, feel and operate. It is with this goal in mind that Education Secretary Paul Reville created the 20-member Board of Elementary and Secondary Education Task Force on 21st Century Skills earlier this year.

The task force members include leaders in business, education and technology and have spent the past several months developing innovative recommendations for ways to integrate 21st century skills in the K-12 curriculum, prepare teachers to teach them, and to find ways to assess each student's level of proficiency. Their recommendations will officially kick start the state's forward movement into the 21st century. Full-scale change will take time, money and support, but is necessary.

In Massachusetts we already lead the nation in test scores. For the good of our children, and their children, we must now focus on becoming a leader in providing a 21st century education.